

WHAT IS CLAIMED IS:

1. A smoking composition comprising a smokable material, a plurality of metallic or carbonaceous catalytic particles having a mean average or a mode average particle size of less than about 20 microns, and a nitrate or nitrite source.
- 5 2. The composition of claim 1 wherein the smokable material comprises tobacco.
3. The composition of claim 1 wherein the tobacco has a reduced or a negligible nicotine content.
- 10 4. The composition of claim 1 wherein the tobacco has a reduced or a negligible content of one or more tobacco-specific nitrosamines.
5. The composition of claim 1 wherein the mean average particle size of the catalytic particles is about 15 μm or less.
- 15 6. The composition of claim 5 wherein the mean average particle size as measured by light scattering of the catalytic particles is from about 4 μm to about 15 μm .
7. The composition of claim 1 wherein the mode average particle size as measured by light scattering of the catalytic particles is about 15 μm or less.
- 20 8. The composition of claim 7 wherein the mode average particle size of the catalytic particles is from about 6 μm to about 13 μm .
9. The composition of claim 1 wherein the catalytic particles comprise at least one noble metal.
10. The composition of claim 1 wherein the at least one noble metal comprises palladium.
- 25 11. The composition of claim 10, wherein said catalytic particles comprise crystalline palladium particles of less than 1 μm in diameter as measured by X-ray diffraction.
12. The composition of claim 10, wherein said catalytic particles comprise crystalline palladium particles of from about 50 nm to about 200 nm in average diameter.
- 30 13. The composition of claim 1 wherein the palladium is derived from ammonium tetrachloropalladate.

14. The composition of claim 1 wherein the smoking composition comprises from about 500 ppm to about 1500 ppm metal or carbon in a form of catalytic particles.

15. The composition of claim 14 wherein the smoking composition comprises from about 700 ppm to about 1000 ppm metal or carbon in the form of catalytic particles.

16. The composition of claim 14 wherein the smoking composition comprises about 800 ppm metal or carbon in the form of catalytic particles.

17. The composition of claim 1 wherein the nitrate or nitrite source comprises a nitrate or nitrite salt.

18. The composition of claim 17 wherein the nitrate salt comprises $Mg(NO_3)_2 \cdot 6H_2O$.

19. The composition of claim 1 wherein the smoking composition comprises from about 0.4 wt. % to about 1.5 wt. % nitrogen in the form of nitrate or nitrite.

20. The composition of claim 1 wherein the smoking composition comprises from about 0.6 wt. % to about 1.1 wt. % nitrogen in the form of nitrate or nitrite.

21. The composition of claim 1 wherein the smoking composition comprises about 0.9 wt. % nitrogen in the form of nitrate or nitrite.

22. The composition of claim 1, wherein the smoking composition further comprises a cavity filter, wherein the cavity filter is substantially filled with an active carbon or active charcoal.

23. The composition of claim 22, wherein the cavity filter is approximately 100 vol. % filled with an active carbon or active charcoal.

24. A method of making a smoking composition that comprises a smokable material and exhibits a reduction in at least one undesirable component arising from pyrolytic reactions of the smokable material, said method comprising the steps of:

providing said smokable material;

applying a plurality of metallic or carbonaceous catalytic particles having a mean average or a mode average particle size of less than about 20 microns to the smokable material;

30 applying a nitrate or nitrite source to the smokable material, before, after or simultaneously with applying the plurality of particles; and

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- forming the smokable material into the smoking composition.
25. The method of claim 24 wherein the undesirable component comprises a polyaromatic hydrocarbon.
- 5 26. The method of claim 24 wherein the undesirable component comprises a tobacco-specific nitrosamine.
27. The method of claim 26 wherein the tobacco-specific nitrosamine comprises 4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone.
- 10 28. The method of claim 24 wherein the undesirable component comprises an azaarene.
29. The method of claim 24 wherein the undesirable component comprises carbazole.
- 15 30. The method of claim 24 wherein the undesirable component comprises a phenolic compound.
31. The method of claim 30 wherein the phenolic compound comprises phenol or catechol.
- 15 32. A method of smoking a smoking composition with reduced exposure to a carcinogenic substance, the carcinogenic substance arising from pyrolytic reactions of a smokable material contained within the smoking composition, the method comprising the steps of:
- 20 providing the smoking composition, the smoking composition comprising said smokable material, a plurality of metallic or carbonaceous catalytic particles having a mean average or mode average particle size of less than about 20 microns, and a nitrate or nitrite source; and
- 25 combusting the smoking composition, whereby smoke is produced, wherein the smoke comprises a reduced amount of the carcinogenic substance relative to the smokable material alone.
33. The method of claim 32 wherein the smokable material comprises tobacco.
34. The method of claim 33 wherein the smoke comprises mainstream smoke.

35. The method of claim 33 wherein the carcinogenic substance comprises 4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone.

36. The method of claim 33 wherein the smoke comprises sidestream smoke.

37. The method of claim 36 wherein the carcinogenic substance comprises 4-

5 (N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone.

38 A method of smoking a cigarette with reduced exposure to an undesirable component of cigarette smoke, the method comprising the steps of:

providing the cigarette comprising tobacco, a plurality of metallic or carbonaceous catalytic particles having a mean average or a mode average particle size of less than about 20 microns, and a nitrate or nitrite source; and

combusting the tobacco composition, whereby a cigarette smoke is produced, wherein the cigarette smoke comprises a reduced amount of an undesirable substance.

39. The method of claim 38 wherein the cigarette smoke comprises mainstream smoke.

40. The method of claim 38 wherein the undesirable substance comprises 4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone.

41. The method of claim 38 wherein the cigarette smoke comprises sidestream smoke.

20 42. The method of claim 41 wherein the undesirable substance comprises 4-(N-nitrosomethylamino)-1-(3-pyridyl)-1-butanone.

43. The method of claim 38 wherein the undesirable substance comprises a polycyclic aromatic hydrocarbon.

44. The method of claim 38 wherein the undesirable substance comprises a
25 tobacco-specific nitrosamine.

45. The method of claim 38 wherein the undesirable substance comprises an
azaarene.

46. The method of claim 38 wherein the undesirable substance comprises carbazole.

30 47. The method of claim 38 wherein the undesirable substance comprises a phenolic compound.

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48. The method of claim 47 wherein the phenolic compound comprises phenol or catechol.